
 **NREL**
National Renewable Energy Laboratory

Renewable Power Overview

Federal Utility Partnership Working Group
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Presentation Outline


- Federal Renewable Goals
- Renewable Power Purchasing Opportunities & Market Status
- Federal Renewable Power Purchases
- Possibilities for a Sustainable Energy Future
- Resources and Assistance

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Executive Order 13123


"Greening the Government Through Efficient Energy Management"

- Section 404 Electricity Use
 - Include green power provisions in RFP's "whenever procuring electricity"
 - Can use energy efficiency savings to pay premium
- Renewables Goal: 2.5% by 2005
 - "**Renewable energy**" means energy produced by solar, wind, geothermal, and biomass power
 - Credit towards EE goals

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Other Federal Renewable Goals

- Department of Energy Directive
 - 3% of DOE electricity from non-hydro renewable energy by 2005
 - 7.5% by 2010
- Wind Powering America
 - Entice federal agencies to purchase 5% of electricity from wind by 2010

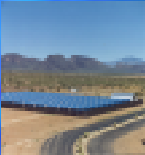
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Options for Meeting Federal Renewables Goal


Low energy design for new buildings




On-site power generation

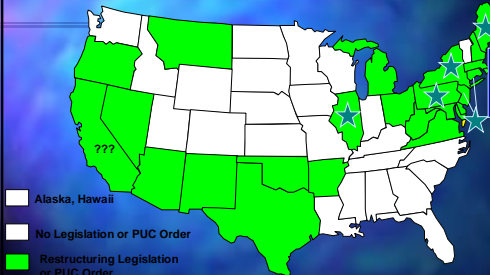


Renewable Power Purchases



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States with Competitive Green Power Offerings



Green power components of GSA contract with Enron begins October 2000 (MA/RJ)


Alaska, Hawaii

No Legislation or PUC Order

Restructuring Legislation or PUC Order

★ Retail and/or Wholesale Green Power Products as of June 2000

• See <http://www.eren.doe.gov/greenpower/marketing.shtml> for most recent information.
• See Green Pricing Map for regulated utility green pricing program information.

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Status of Green Power Markets

At risk due to volatile energy markets

- California
 - Most suppliers have left the market
 - Qualified Facilities struggling also
- Pennsylvania/New Jersey also affected
 - Conectiv Energy, AES Power Direct, Utility.com gone
 - Some suppliers remain
- Hope for Connecticut, Texas?

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Green-e Certification

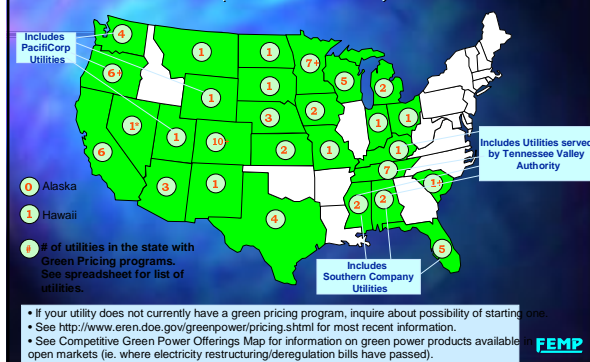


- Voluntary certification/verification program
- In CA, PA, NJ, CT
- Product requirements:
 - At least 50% Renewable
 - Balance must have lower air emissions and less nuclear content than system mix
 - Requirements for % New
- Low Impact HydroPower Institute Standards
- Green Pricing Accreditation Program

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Regulated Utility Green Pricing Programs

(as of November 2000)



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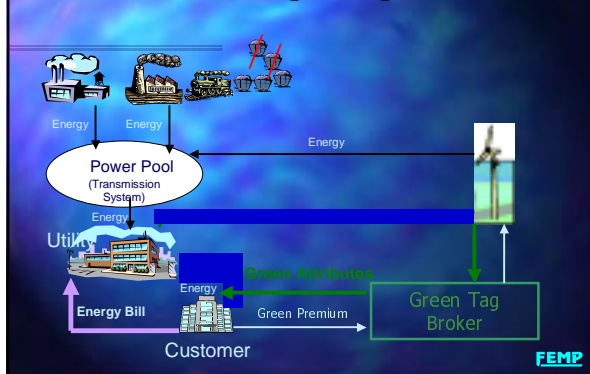
Green Tags Description

(also known as Renewable Energy Credits, etc)

- Indirect method to purchase green power
- Generic electricity delivered by utility, environmental attributes from Green Tag supplier
- Utility provider and bill does not change
- Above market premium paid to supplier (most likely a renewable developer)

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Green Tags Diagram



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Federal Sector Renewable Power Purchase Contracts

(Regulated Utility Green Pricing)

Federal Agency (ies)	Location	kWh	Resource
EPA	Golden, CO	2.0 million	Wind
BPA	Portland, OR	0.552 million	Wind
Oak Ridge National Lab.	Oak Ridge, TN	0.675 million	Landfill Gas/Wind/Solar

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Federal Sector Renewable Power Purchase Contracts

(Competitive Markets)

Federal Agency (ies)	Location	kWh	Resource
US Postal Service *	California	30 million	Geothermal/Biomass/S mall Hydro
GSA	MA & RI	4.8 million	Landfill Gas
Hanscom AFB	MA & RI	5% of load	Landfill Gas
GSA/EPA/NPS	Pennsylvania	2.7 million	Landfill Gas
EPA *	Richmond, CA	1.8 million	Landfill Gas/Geothermal

*USPS contract with Go-Green was terminated. USPS is working on finding an

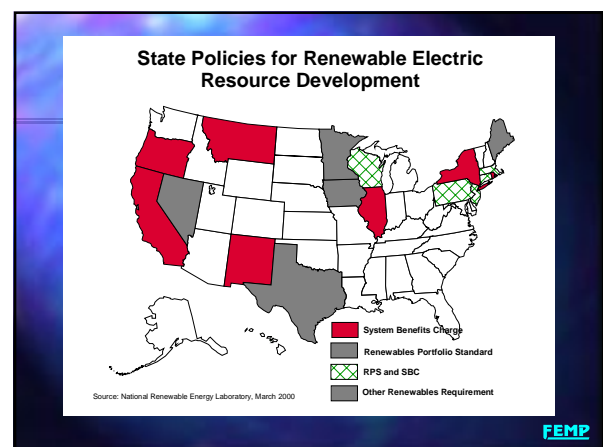
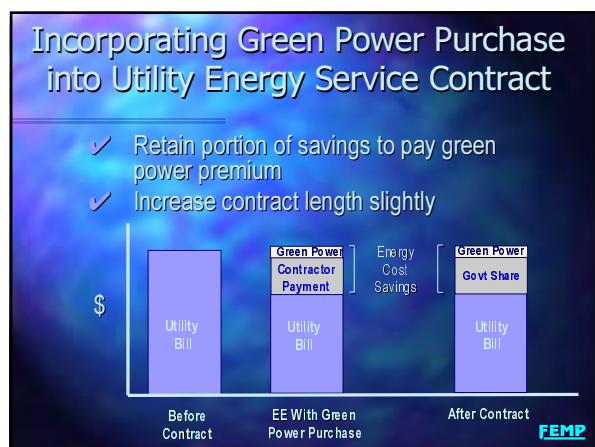
Federal Sector Renewable Power Purchase Contracts

(Green Tags)

Federal Agency (ies)	Location	kWh	Resource
EPA	Manchester, WA	2.1 million	Wind
EPA	Chelmsford, MA	1.9 million	Wind

- ## Lessons Learned
- Green Tags are available anywhere
 - FAR Part 23.703 "Environmentally Preferable Purchasing" - can be used as justification (formerly FAR Part 23.704)
 - Premiums (if any) may be lower than you expect - market prices increasing, renewable power costs continue to decrease
 - Volatile energy markets provide both opportunities and risks for green power
 - Risk management to help mitigate price volatility

- ## If there is a Premium...
- Energy efficiency projects (per EO 13123, Section 404c1, 406c)
 - State renewables funding
 - Alternative gas supplier through GSA or DESC
 - Choosing alternative electricity supplier (???)



Generation Mix

(1998 for CA, 1997 for US)

Resource Mix	CA	U.S.
Coal	20%	57%
Nuclear	16%	20%
Hydro	22% ¹	11%
Natural Gas	31%	9%
Oil	0%	2.5%
Renewables ²	11%	.2% ³

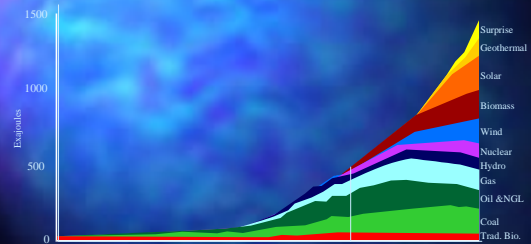
¹ Large Hydro (>30 MW)

² Includes small hydro for California

³ 2.5-3% including on-site biomass

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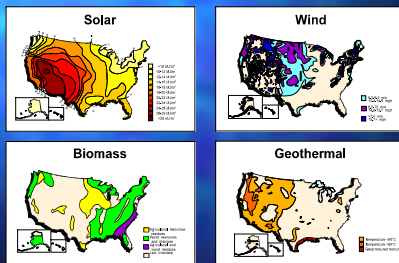
Shell Sustained Growth Scenario



Source: Shell, The Evolution of the World's Energy Systems, 1995

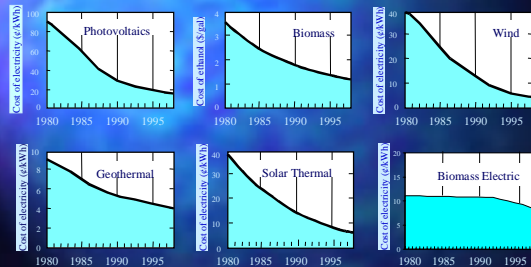
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U.S. Renewable Energy Resources



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Renewable Energy Cost Trends



Source: Billman, Advances in Solar Energy submission, 1/8/99

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A Growing Market for Renewables

Opportunities for U.S. Companies



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Resources

- Purchasing Renewable Energy: A Guidebook for Federal Agencies
<http://www.eren.doe.gov/femp/utility.html>

- Green Power Toolkit

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Web Sites

- **Green Power Network** - www.eren.doe.gov/greenpower/home.shtml
- **Green-e Certification** - www.green-e.org
- **EO 13123** - www.eren.doe.gov/femp/aboutfemp/exec13123.html
- **EO 13123 Guidance** -
<http://www.eren.doe.gov/femp/aboutfemp/guidances.html>
- **GSA RFP's** - www.ncum.gsa.gov/solicitations/default.htm
- **DOD RFP's** - www.desc.dla.mil/main/a/electric/index.htm
- **FEMP's Restructuring Web Site** - www.femp-restructuring.org/
- **EIA's Restructuring Web Site**
www.eia.doe.gov/cneaf/electricity/chg_str/tab5rev.html

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